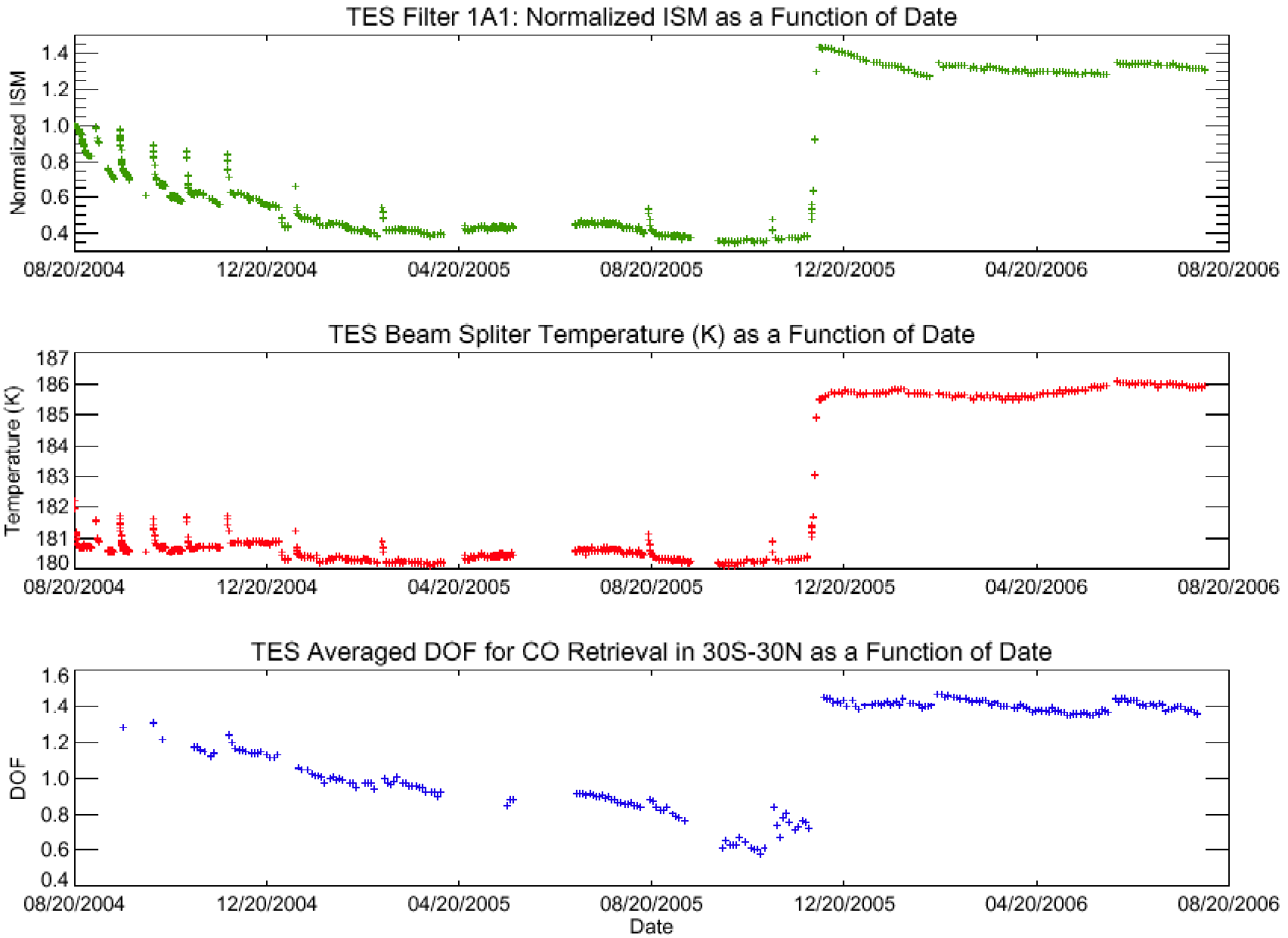
TES CO Validation Status

Ming Luo and the TES team

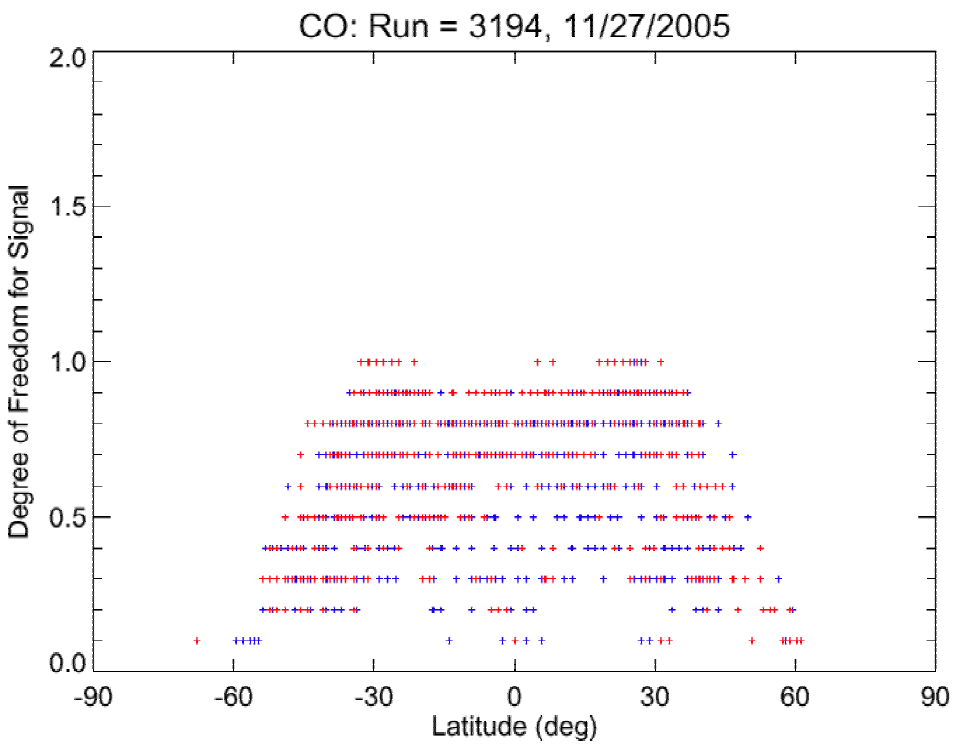
September 2006

Improvement in CO retrievals since TES optical bench warm-up in early Dec 2005 (DOF doubled, precision halved).



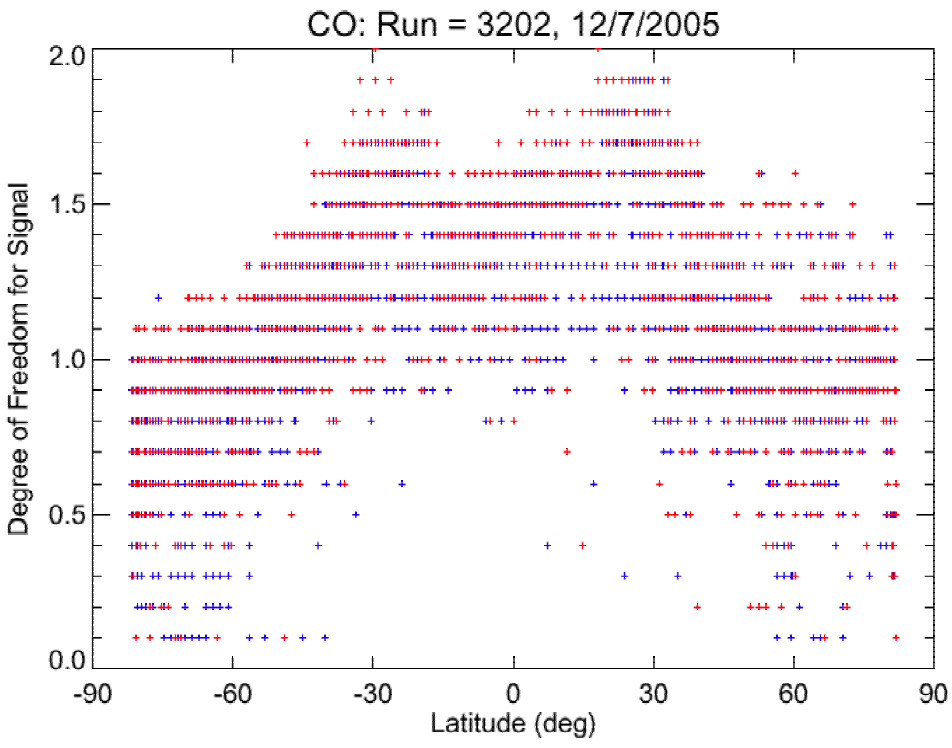
CO: Degree of Freedom for Signal (DOF)

Pre-Warmup



30S-30N: DOFs = 0.72

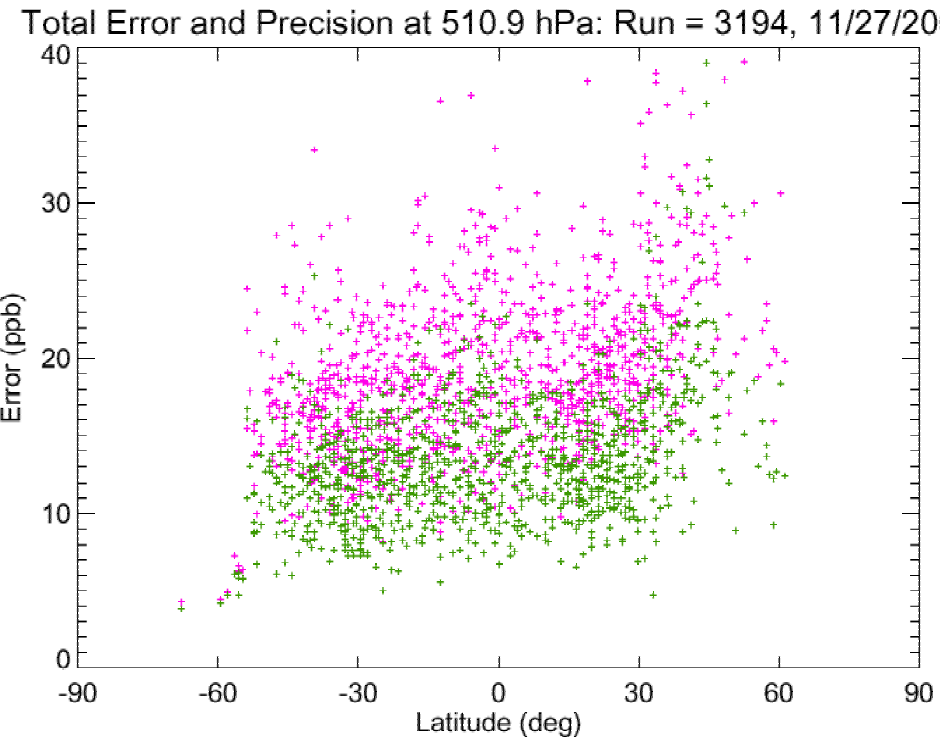
Post-Warmup



30S-30N: DOFs = 1.45

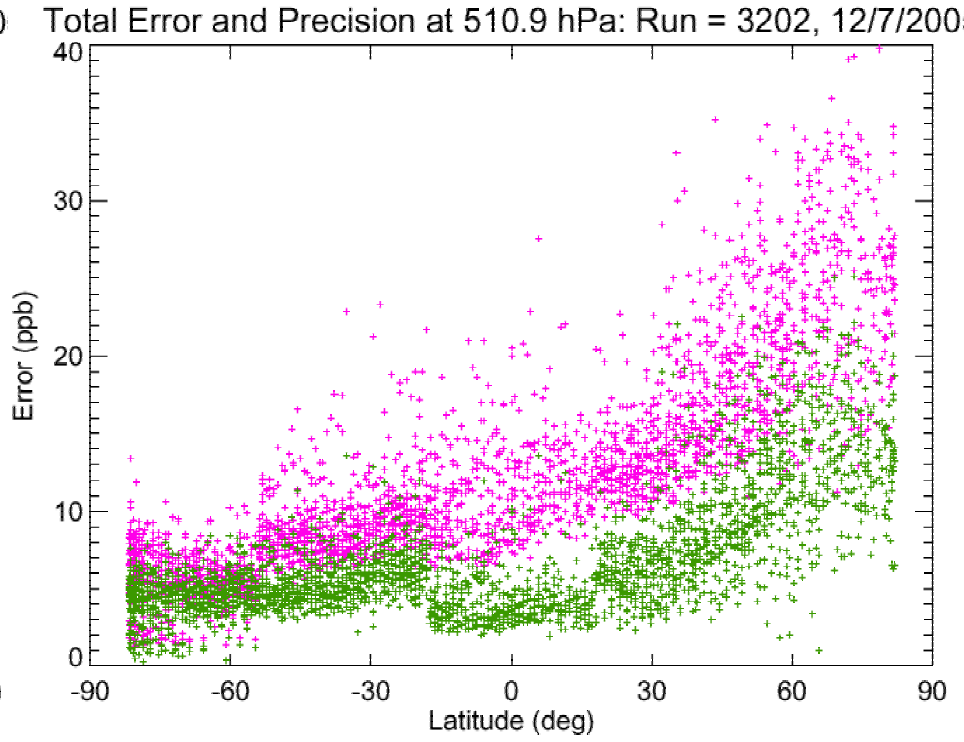
CO: Total Error and Precision at 511 hPa

Pre-Warmup



30S-30N: Total Err = 19 ppb
Precision = 10 ppb

Post-Warmup



30S-30N: Total Err = 11 ppb
Precision = 5 ppb

Comparison Sources	Progress	Results / problems
MOPITT	• Data from Sept 20-21, 2004. JGR paper in review for 85+ days! • Monthly	• Good agreement in global patterns • Influence of *a priori* constraints on CO retrievals of both instrument. The agreement much improved after adjusting the retrieval with *a priori* info. • MOPITT will release V4 data
ACE MLS AIRS	• Time trends with ACE data in upper trop • One day 2004 data with MLS in upper trop • AIRS in preparation	• Good agreement with ACE • MLS being too high • Understand AIRS AK
AVE (Argus) CARVE (Alias)	• Comparisons made AVE-04; paper will go to special JGR issue	• Agreement within CO area variability and the estimated errors of 10-20%.
INTEX-B (DACOM)	• Comparisons made; paper will go to special JGR issue	• Agreement within CO area variability and the estimated errors of 10-20%. in Houston area.
MOZAIC	• Comparisons made Sept 04 – May 05	• Agreement within CO area variability and estimated errors of 10-20% in most airports. • Waiting for data after May 2005.

TES CO papers

- C. Rinsland, M. Luo, et al.: Nadir Measurements of Carbon Monoxide (CO) Distributions by the Tropospheric Emission Spectrometer Instrument onboard the Aura Spacecraft: Overview of Analysis Approach and Examples of Initial Results, submitted to GRL, in review.

- M. Luo, C. Rinsland, C. Rodgers, J. Logan et al, Comparison of carbon monoxide measurements by TES and MOPITT - the influences of a priori data and instrument characteristics on nadir atmospheric species retrievals, submitted to JGR-Atmospheres, in review.

- To Aura JGR special issue:
  - M. Luo et al., TES CO validation in INTEX-B
  - Argus team, Measurement of CO during AVE